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preliminary attack of seedlings, no leaf change takes place. Finally, however, as the lesions become confluent and a collar rot is being effected the margins of the outer leaves take on a reddish tinge; this latter symptom is usually followed by wilt and a quick collapse.

It is in half to two thirds grown plants that the disease is seen at its worst. Here it causes a rapid destruction of the cambium at a level with the ground, which extends quickly above and below. The fungus penetrates the xylem, followed by bacterial decay. The severely affected plants show a metallic bluish-red color on the margins of the outer leaves, with also some evidence of wilt.

The rot lesions extend deeply into the stem. As soon as a collar rot is effected the plant collapses with a sudden wilt. Soon the stem becomes so badly rotted that the wind often upsets the plant by breaking its connection with the root, and the plant blows away.

Even in the advanced stages of the disease the fruiting bodies of the parasite may be found at the margins of the lesions.

The losses in the Clyde and Fremont districts have been excessive. In the vicinity of Clyde it has been working in conjunction with the *Fusarium* wilt, the two diseases having almost driven the cabbage growers out of the business. Several cases were noted by growers where their fields last year suffered almost total loss from this disease. In a field at Fremont put to cabbage both last year and this, the amount of *Phoma* infected plants was fully 65 per cent. on date of August 4, this season.

The progress of cabbage diseases at Fremont, which is a comparatively new cabbage district, shows the *Phoma* wilt is much more aggressive at present than the *Fusarium* wilt, though the latter has appeared in a very limited amount in two fields.

During the season the disease has been reported with specimens from several other localities in the state. From a statement made by F. L. Washburn, state entomologist, in his 1906 report (p. 18) to the governor of Minnesota, it is quite probable that the disease

appears there. He notes in reviewing the club root of cabbage, "Many market gardeners confound the work of the maggot with diseases which affect the root and have no connection whatever with the maggot. This is noticeably true of a form of rot which sometimes affects the roots, causing wilting and death of the plant."

That cabbage maggots, the cabbage curculio and wireworms are active in furthering the disease, is noted by Bos and Quanjier (see both citations above). The latter has shown that *Phoma oleracea* Sacc., which heretofore has been regarded as a saprophyte, is directly pathogenic on fully grown and harvested cabbage heads, but somewhat weakly parasitic on germinating plantlets and rapidly growing seedlings.

The writer has observed that seedlings of the varieties All Season and Market Garden are early and quite susceptible to this fungus.

A preliminary bulletin is being prepared calling attention to the nature of the disease, and to practises which are useful in avoiding both the *Phoma* wilt and the *Fusarium* wilt. The investigations on these diseases will be continued.

THOS. F. MANNS

DEPARTMENT OF BOTANY,
AGRICULTURAL EXPERIMENT STATION,
WOOSTER, OHIO,
September 8, 1910

SOCIETIES AND ACADEMIES

THE AMERICAN MATHEMATICAL SOCIETY

THE one hundred and fiftieth regular meeting of the society was held at Columbia University on Saturday, October 29, extending through the usual morning and afternoon sessions. Forty-three members were present. Ex-president W. F. Osgood occupied the chair at the morning session, Ex-president H. S. White and Professor Edward Kasner at the afternoon session. The following new members were elected: Dr. G. A. Campbell, American Telephone and Telegraph Company; Mrs. E. B. Davis, Nautical Almanac Office; Professor C. W. Emmons, Simpson College; Professor H. C. Feemster, York College; Mr. R. R. Hitchcock, University of North Dakota; Mr. W. J. Montgomery, University of Michigan; Professor

C. C. Morris, Ohio State University; Mr. H. S. Newcomer, University of Wisconsin; Professor A. D. Pitcher, University of Kansas; Professor George Rutledge, Georgia School of Technology. Four applications for membership were received. The official list of nominations of officers for the coming year was prepared in anticipation of the annual election in December.

The society is preparing to publish the Colloquium lectures delivered at the summer meeting at Princeton in 1909 by Professors Bliss and Kasner. It has also arranged to republish the Evanston Colloquium lectures of Professor Felix Klein, the original edition of 1894 being out of print.

The following papers were read at the October meeting:

G. A. Miller: "The group generated by two conjoints."

O. E. Glenn: "The conditions that a p -ary form of order m be a perfect m th power."

Edward Kasner: "A second converse of the theorem of Thomson and Tait."

L. L. Silverman: "Generalized definitions of the sum of convergent series."

H. H. Mitchell: "Note concerning a collineation group in n variables."

R. D. Carmichael: "Mixed equations and their analytic solutions" (preliminary communication).

G. A. Miller: "The groups generated by two conjoints."

The Southwestern Section of the society meets at the University of Nebraska on November 26. The annual meeting of the society will be held at Columbia University on December 28-29. The Chicago Section will hold its winter meeting at Minneapolis on December 29-30.

F. N. COLE,
Secretary

THE CHEMICAL SOCIETY OF WASHINGTON

THE 200th meeting of the society was held at the Public Library, October 13, 1910, at 8 P.M. President Failyer called the meeting to order, the attendance being 52. A committee was appointed to take suitable action on the death of Dr. W. H. Seaman, a past president and the first treasurer of the society. The following papers were then read: "The Mechanism of a Peroxidase Reaction," by H. H. Bunzell; "Biophotogenesis," by F. Alex. McDermott.

In Dr. Bunzell's paper experimental evidence was given that the oxidation of pyrogallol by hydrogen peroxide in the presence of oxidizing

enzymes goes on in two stages. The first step in the oxidation is the conversion of the pyrogallol into a soluble red compound; the second stage is the transformation of the latter into the insoluble purpurogallin. The first step is brought about by hydrogen peroxide in the absence of oxidase. It may be carried out also by atmospheric oxygen alone, in which case the oxidation goes on very much more slowly than if hydrogen peroxide is used. The passage of air will accelerate the action of the hydrogen peroxide on the pyrogallol. The second step is brought about by oxidase alone in the absence of peroxide.

Mr. McDermott's paper was essentially a review of the more salient known facts and theories regarding the production of light by living organisms, with especial reference to some recent work, now in press, of Professor Joseph H. Kastle, of the University of Virginia, with the author, on the local firefly, *Photinus pyralis* L.

Most chemical and physical agents produce light-emission by this insect; a few inhibit it. The light appears to be the result of an oxidation in the presence of water; what substance is oxidized is not known. Luminous insects frequently contain a substance giving fluorescent solutions.

J. A. LE CLERC
Secretary

THE AMERICAN CHEMICAL SOCIETY NORTHEASTERN SECTION

THE ninety-ninth regular meeting of the section was held at the Twentieth Century Club, Boston, on October 21.

Dr. Latham Clarke, of Harvard University, addressed the section upon "Hydrocarbons of the Formula C_8H_{18} ." He described in detail a typical method of preparation for one of the series and then pointed out some striking relations between the boiling points and structures of many of this series, which had been made for the first time in this research.

Professor Arthur W. Ewell, of the Worcester Polytechnic Institute, addressed the section upon "Artificial Optical Activity." The speaker described his method of causing the rotation of polarized light by passing it through cylinders of gelatine which had become somewhat distorted by twisting. He stated what variables determined the value of the rotation and offered the suggestion of molecular distortion as a possible cause of optical activity of solutions.

K. L. MARK,
Secretary